

# Comparisons of Job Characteristics

Focus Occupation: **Materials Engineers (17-2131)**

Associated Occupation: **Chemical Engineers (17-2041)**

[Compare Knowledge](#)

[Compare Skills](#)

[Compare Abilities](#)

[Compare Detailed Work Activities](#)

[Compare Tools and Technologies](#)

<<	Focus occupation element is much lower
<	Focus occupation element is lower
0	Focus occupation element is at a similar level
>	Focus occupation element is at a higher level
>>	Focus occupation element is at a much higher level

## Knowledge

Similarity of Focus Occupation to Associated Occupation: 94

Focus Occupation: Materials Engineers (17-2131)  
Associated Occupation: Chemical Engineers (17-2041)

Associated Occupation's Key Knowledge Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Engineering and Technology	5.7	24.1	18.9	<<	Extensive education and/or training may be required
Chemistry	4.8	20.5	15.3	<<	Extensive education and/or training may be required
Mathematics	9.2	19.4	11.8	<<	Extensive education and/or training may be required
Physics	4.3	16.9	10.6	<<	Extensive education and/or training may be required
Production and Processing	6.0	15.4	8.1	<<	Extensive education and/or training may be required
Design	5.2	15.2	7.9	<<	Extensive education and/or training may be required
Administration and Management	8.4	12.7	7.4	<<	Extensive education and/or training may be required
Biology	3.7	9.6	1.8	<<	Extensive education and/or training may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Skills

Similarity of Focus Occupation to Associated Occupation: 84

Focus Occupation: Materials Engineers (17-2131)  
Associated Occupation: Chemical Engineers (17-2041)

Associated Occupation's Key Skills Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Science	4.5	18.0	13.0	<<	Extensive development of skills in this area may be required

Mathematics	6.2	14.7	9.1	<<	Extensive development of skills in this area may be required
Judgment and Decision Making	9.4	14.6	11.0	<<	Extensive development of skills in this area may be required
Complex Problem Solving	9.1	14.5	12.0	<	A higher skill level may be required
Systems Analysis	6.5	14.1	8.9	<<	Extensive development of skills in this area may be required
Operations Analysis	5.0	13.5	11.7	<	A higher skill level may be required
Systems Evaluation	6.4	13.4	8.7	<<	Extensive development of skills in this area may be required
Troubleshooting	4.5	10.4	5.2	<<	Extensive development of skills in this area may be required
Technology Design	2.6	8.5	4.4	<<	Extensive development of skills in this area may be required
Management of Financial Resources	3.3	7.4	4.3	<<	Extensive development of skills in this area may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

Abilities		Similarity of Focus Occupation to Associated Occupation: 96			
Focus Occupation: Materials Engineers (17-2131) Associated Occupation: Chemical Engineers (17-2041)					
Associated Occupation's Key Abilities Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Oral Comprehension	12.5	15.8	14.1	<	Some improvement in abilities may be required
Category Flexibility	9.0	15.2	11.5	<<	Extensive improvement in abilities may be required
Deductive Reasoning	10.6	15.2	14.2	0	Current ability level may be sufficient
Information Ordering	9.9	15.1	11.5	<<	Extensive improvement in abilities may be required
Problem Sensitivity	11.1	14.8	14.7	0	Current ability level may be sufficient
Inductive Reasoning	10.2	14.6	13.9	0	Current ability level may be sufficient
Mathematical Reasoning	6.3	14.2	10.2	<<	Extensive improvement in abilities may be required
Number Facility	6.3	13.4	9.2	<<	Extensive improvement in abilities may be required
Originality	7.6	13.0	10.6	<	Some improvement in abilities may be required
Visualization	7.5	11.7	9.5	<	Some improvement in abilities may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

Activities that Both Occupations Have in Common	Similarity of Focus Occupation to Associated Occupation: 97
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**Focus Occupation: Materials Engineers (17-2131)**  
**Associated Occupation: Chemical Engineers (17-2041)**

Work Activities	Exclusivity of Activity
Advise clients or customers	19
Advise clients regarding engineering problems	67
Analyze engineering design problems	69
Analyze engineering test data	71
Analyze project proposal to determine feasibility, cost, or time	69
Analyze scientific research data or investigative findings	27
Analyze technical data, designs, or preliminary specifications	47
Analyze test data	64
Calculate engineering specifications	64
Collect scientific or technical data	30
Communicate technical information	4
Compile numerical or statistical data	38
Conduct laboratory research or experiments	57
Conduct standardized qualitative laboratory analyses	62
Conduct standardized quantitative laboratory analyses	62
Confer with engineering, technical or manufacturing personnel	25
Confer with research personnel	50
Confer with scientists	54
Coordinate engineering project activities	71
Create mathematical or statistical diagrams or charts	43
Delegate authority for engineering activities	73
Design engineered systems	75
Design machines	82
Design manufacturing processes or methods	77
Develop or maintain databases	30
Develop plans for programs or projects	31
Develop policies, procedures, methods, or standards	21
Develop tables depicting data	33
Direct and coordinate activities of workers or staff	3
Draw prototypes, plans, or maps to scale	57
Estimate cost for engineering projects	69
Evaluate costs of engineering projects	70
Evaluate engineering data	60
Evaluate manufacturing or processing systems	68
Examine engineering documents for completeness or accuracy	62
Explain complex mathematical information	30
Follow manufacturing methods or techniques	73
Follow safe waste disposal procedures	50
Lead teams in engineering projects	73
Plan testing of engineering methods	72
Prepare reports	8
Prepare technical reports or related documentation	22
Provide analytical assessment of engineering data	75

Read technical drawings	7
Resolve engineering or science problems	46
Test equipment as part of engineering projects or processes	67
Understand engineering data or reports	48
Understand properties of gases or liquids	78
Use chemical testing or analysis procedures	54
Use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks	58
Use computers to enter, access or retrieve data	3
Use drafting or mechanical drawing techniques	50
Use government regulations	44
Use hazardous materials information	35
Use intuitive judgment for engineering analyses	72
Use knowledge of investigation techniques	16
Use mathematical or statistical methods to identify or analyze problems	30
Use pollution control techniques	62
Use project management techniques	47
Use quantitative research methods	35
Use relational database software	26
Use research methodology procedures within manufacturing or commerce	75
Use scientific research methodology	21
Use spreadsheet software	18
Use technical information in manufacturing or industrial activities	67
Use technical regulations for engineering problems	61
Use word processing or desktop publishing software	17
Work as a team member	36
Write business project or bid proposals	48
Write product performance requirements	78

Not all positions in these occupations will necessarily perform all of the listed activities. The exclusivity rating is an indication of how unique the activity is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations engage in that activity.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Tools and Technologies that Both Occupations Have in Common

Similarity of Focus  
Occupation to Associated  
Occupation: 79

**Focus Occupation: Materials Engineers (17-2131)**  
**Associated Occupation: Chemical Engineers (17-2041)**

Tools and Technologies	Exclusivity
Business function specific software	1
Chromatographic measuring instruments and accessories	16
Computers	1
Content authoring and editing software	1
Data management and query software	1
Development software	4
Industry specific software	1
Laboratory centrifuges and accessories	13
Laboratory decanting and distilling and evaporating and extracting equipment and supplies	19

Laboratory mixing and stirring and shaking equipment and supplies	19
Spectroscopic equipment	10
Viewing and observing instruments and accessories	4
Vision protection and accessories	3
Water treatment and supply equipment	21

Not all positions in these occupations will necessarily use all of the listed tools and technologies. The exclusivity rating is an indication of how unique the tool or technology is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations use that tool or technology.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.